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To What Stellar System Does Our Sun Belong? [by Professor J. C. Kapteyn].

From *Koninklijke Akademie van Wetenschappen te Amsterdam, Afdeeling Natuurkunde, Zitting van 29 April, 1892.*

[Translation and Abstract from the original Dutch by E. S. H.]

"Professor Kapteyn discussed the question of the distribution of stars in space. Up to this time investigations upon this distribution have set out from the assumption that in the present state of science the distances of the fixed stars could best be estimated by a consideration of their proper motions. Investigations by Safford, Plummer, Stumpe, etc., have approached the question from that side. Professor Kapteyn has made a comparison between the *spectral-type* of the stars and their different proper-motions. The spectral-type for each star is taken from the Draper Catalogue of Pickering; the proper-motion from Stumpe's list in *Astronomische Nachrichten*, Nos. 2999–3000. Of the 1054 stars in this list, 476 stars brighter than the 7.0 magnitude were found in the Draper Catalogue. The others were either too faint or too far south. Besides these stars 115 others with small proper-motions (in R. A., less than $0^{s}.003$, in Decl., less than 0″.03) were included from Auwers' Bradley. If we call Q the quotient obtained by dividing the number of stars of Type II* by the number of stars of Type I*, and if we arrange the data in the order of the proper-motions we obtain the following table :

Proper-Motions.	Mean Proper-Motion.	No. of Stars. Type I.	No. of Stars. Type II.	No. of Stars. Type III.	Q
From 7″.0 to 0″.7 ...	1″.39	3	51	—	17.0
" 0 .7 " 0 .4 ...	0 .92	12	66	1	5.5
" 0 .4 " 0 .3 ...	0 .35	14	66	—	4.7
" 0 .3 " 0 .2 ...	0 .24	34	124	—	3.65
" 0 .2 " 0 .16...	0 .18	35	67	3	1.9
Small...............	Small.	79	35	1	0.44

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* Type I consists of stars whose spectra are like that of *Sirius*.
Type II " " " " " our Sun.

"From this table the following conclusions can be drawn:

"The nearest neighbors of our Solar-system are almost exclusively stars of Type II (like our own sun); as we go further from the sun the number of stars of the first type relatively to the number of those of the second regularly increases, proportionately to the distance (or at least inversely proportional to the proper-motion) until we reach a distance which corresponds to a proper-motion of approximately 0″.2.

"With removal to still greater distances the stars of the first type predominate, so that if we include those BRADLEY stars whose proper-motion is so small as to be hardly determinable with accuracy, we shall find about twice as many of the first type as of the second among them.

"The DRAPER Catalogue contains few stars south of Declination —25°. Certain considerations make it very probable, however, that the stars of the southern hemisphere are similarly distributed.

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"Professor KAPTEYN next examined the two following questions:

"1°. Is our Solar-system situated exactly in the centre of the (stellar) system—that is, in that place where the stars of Type II are most numerous?

"2°. What relation does the Milky Way bear to the System?

"Various considerations lead to the general conclusion that the form of our stellar-system may be like that of a sphere surrounded by a ring. Investigations now in progress will throw much light on these questions."

PHOTOGRAPHS OF THE PHENOMENA WHICH ACCOMPANY THE INGRESS OF THE SHADOWS OF THE SATELLITES OF *JUPITER*.

The photographs of *Jupiter* (enlarged direct with the new BRASHEAR amplifier, which magnifies 5 diameters), on October 24th of this year are especially interesting. They cover the time from 7^h 27^m to 14^h 18^m (when the sky became hazy), and show the shadows of Satellites I and II on the disc, the *egress* of I from transit, the *ingress* of the shadow of II, etc. The latter phenomenon took place at about 7^h 35^m P. S. T., by the American Ephemeris. The corresponding negative has nine images on it which were made at the following times: